313 the small industries of the remoter upland districts. It is particularly important in the wood and pulp and paper industries, and in the small textile and pottery works. Charcoal is still used for smelting.

●377 ELECTRICITY is mainly generated thermally, in spite of the great potentialities of water-power provided by the rivers from the Carpathians, not to mention the Danube current. Lack of natural reservoirs in snow-field, glacier and lake means that exploitation of the hydro-electric resources would entail enormous capital expenditure in the construction of reservoirs. The sum total of direct water-power used must, however, be very great, for the number of water-wheels is legion.

317 SALT is another asset of real importance. Like the mineral oil, it is found in greatest abundance, and is most accessible, in the upper Tertiary deposits of the sub-Carpathians, in the region of greatest disturbance. Sometimes it is exposed in cliffs, sometimes it is covered with thin layers of loam. Salt mines are being worked at Slanic, at Targu-Ocna (Tergu Ocnei) in the Trotuş basin, and at Ocnele-Mare (Ocna) on
316 the Olt. In 1932 the amount extracted was 288,000 metric tons, of which 240,500 tons were for home consumption, the rest being exported to the Balkan countries and to Russia. Salt mining and marketing are state monopolies.

IN iron ore Roumania is not rich, the output being only about 90,000 tons per annum. The most important deposits lie in the mountains of the Banat and in the Poiana Ruscai (Ruszka) massif farther north, between the Mureş and the Bistra (Bisztra) tributary of the Timiş (Temes). The Reciţa (Reciţa Montana) district in the Banat mountains, opening towards Hungary, has foundries and steel works employing about 15,000 hands.

WITH the recent rise in the price of gold, the mining of that metal, which formerly was almost negligible, has become more active, and the output reached nearly 4,000 kgs. in 1933. The ore is mined in the Trachyte massif of the Bihor.

433 IN SPITE of considerable advantages in natural resources, and solicitous nursing on the part of the State, particularly in the Old Kingdom, industry in Roumania is still in its

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CHAPTER III

3. Coke Imports and Production

	Imports	*Production**
	in '000 tons	
1936	39	78
1937	49	78
1938	63	86
1939	55	88
1940	54	86
1941	n.a.	90

* Including gas coke.

Of the total coke available annually—140,000 tons—100,000 tons were consumed by blast-furnaces and iron-works, the remaining 40,000 by other industries.

II. ELECTRIC POWER

A. General

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Being an agricultural country, Rumania, like the other countries of South Eastern Europe, is not extensively developed from the electrical point of view. The most important high-tension transmission lines are located in the neighbourhood of the Prahova oilfields and of Bucarest, but though these two areas are interconnected by means of lines operating at 120 and 60 kV, there is no national grid. There are a few other high or medium-tension lines which mostly connect power stations owned by industrial concerns. The majority of generating stations giving a public supply are quite isolated from each other.

1. Sources of Power

Rumania's potential water-power resources are high. It is estimated that 24,000 million kWh could be obtained annually from the economically

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exploitable water-courses, necessitating the installation of 5,500,000 kW of plant. The water power developed so far, however, amounts to about 50,000 kW. This failure to exploit the available water power is mainly attributable to the abundance of native fuel oil and low-grade coal, and to the high initial capital costs which hydro-electric development entails. In 1938, therefore, about 63 per cent. of the plant installed in Rumanian public-supply stations was of a thermal type, 25 per cent. was Diesel and only 12 per cent. hydro-electric. By 1940 the percentages were 66 : 17 : 17. The table below gives figures of total capacity and output of both public and industrial stations in recent years.

2. Present Output and Utilisation

It is estimated that in 1942 output did not exceed 1,130 million kWh from a total installed capacity of about 506,000 kW. (These totals include capacity and output of those stations in Bessarabia and N. Bucovina which were regained in 1941.)

The following table shows the probable consumption of electric power in 1942 by the various consumer groups:

	Millions of kWh Consumed	*% of Total Output*
Industrial	791·0	70·0
Household uses and private lighting ..	124·3	11·0
Public lighting ..	17·0	1·5
Agriculture	5·6	0·5
Transmission losses ..	192·1	17·0
	1,130·0	100·0

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INSTALLED CAPACITY AND OUTPUT OF PUBLIC AND INDUSTRIAL STATIONS

Year	Public Stations		Industrial Stations		Total	
	Installed Capacity '000 kW	Output in million kWh	Installed Capacity '000 kW	Output in million kWh	Installed Capacity '000 kW	Output in million kWh
1933 ..	212	345	160	268	372	593
1935 ..	217	413	218	454	435	867
1937 ..	261	537	248	540	509	1,077
1938 ..	262	568	248	580	510	1,148
1939 ..	285	582	260	630	545	1,212
1940* ..	241	548	259	617	401	1,165

* Allowance made for the loss of N. Transylvania, S. Dobruja, Bessarabia and N. Bucovina.

B. Generating Stations

As will be seen from the following list of Public Supply Plants which it is believed includes all stations with an installed capacity of 5,000 kW and over, only eight of the power stations have a capacity of more than 10,000 kW.

1. Public Supply Plants

Location	Installed Capacity (kW)	Type (Thermal or Hydro)
Bucarest : Grotăvești	85,000	Steam
Câmpina	28,150	Steam
Gura-Ocniței	20,450	Steam
Dobrești	20,000	Hydro
Schitu-Golești	19,200	Steam
Bucarest : Filaret	16,250	Diesel
Gâlma	10,700	Hydro
Sinaia	10,500	Hydro
Timișoara	9,675	87% Steam, 13% Hydro
Arad	7,840	Steam
Cernăuți	7,675	80% Steam, 20% Diesel
Brăila	7,630	83% Steam, 17% Diesel
Florești	6,300	Steam
Oradea*	6,280	Steam
Sibiu	6,250	Diesel
Brașov	5,800	Steam
Galați	5,000	Steam
Constanța	5,000	Steam

* This plant is now in Hungarian territory.

[18c]

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2. Industrial Generating Plants

Location	Installed Capacity (kW)	Type	Owner
Dicio Sân Martin ..	24,000	Steam	Nitrogen S.A.
Lupeni-Vulcan ..	19,200	Steam	Petroşani S.A.R.
Anina	11,780	Steam	Uzinele de Fier şi Domeniile din Reşiţa
Turda	9,400	Steam	Fabrica de Ciment din Turda S.A.
Domniţa Maria ..	9,150	68% Steam, 17% Diesel, 15% Hydro	Letea S.A.R.
Reşiţa	8,700	52% Steam, 48% Gas	Uzinele de Fier şi Domeniile din Reşiţa
Aghires, Cluj* ..	8,400	Steam	Sorecani S.A.
Schela Moreni ..	7,750	77% Steam, 23% Gas	Astra Romana

* Now in Hungary.

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●377 The above list contains only the most important industrial stations, most of which also supply public requirements in their areas.

C. TRANSMISSION SYSTEM

1. Bucarest Area

Dobreşti hydro-electric station is connected with Bucarest by a 120-kV line 70 miles long. This line passes through Doiceşti, north of Târgovişte, and thence to Bucarest via Chitilla. At Doiceşti some power is stepped down to 60 kV and is transmitted to Bucarest via Ploeşti.

Schitu Goleşti thermal station, also 70 miles north of Bucarest, is connected with Doiceşti by a 60-kV line.

2. Prahova Area

The Concordia Petroleum Company owns an extensive distribution network. Its power stations supply not only the installations on the Prahova oilfields, but also the communities of Braşov, Buşteni, Sinaia, Câmpina, Ploeşti and other centres. The Gura Ocniţei station of this company is connected to Floreşti station (owned by Steaua Electrică S.A.R.), by 60-kV lines, which also interconnect with the Doiceşti transformer station of the Bucarest system. Other lines operated at 60 kV run between Floreşti and Ploeşti, and between Floreşti and Bucarest. Floreşti is linked with the Câmpina and Sinaia stations of the Concordia Company by 25-kV lines, which pass northwards to Braşov.

3. Sibiu Area

The industrial generating station Dicio Sân Martin is the chief source of electric current. It is linked with Sibiu by a 100-kV line, and with the other small stations in this and the surrounding areas by lines at lower voltages.

D. FUTURE DEVELOPMENTS

377 An official decree published in August, 1942,
371 ordered the electrification of the Rumanian State Railways, and at that same time the economies which would result from the devel-op-

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ment for this purpose of hydro-electric power in place of the coal, which is at present used, were pointed out. A scheme providing for the construction both of hydro-electric stations and of thermal reserve stations for this purpose has been prepared, and includes initially the carrying out of the "Bicaz" project on the River Bistrița, near Tarcău. At this place a dam is to be built to form a regulating reservoir, the water from which will serve to irrigate areas at present uncultivated. In a normal year, a total output of 400-600 million kWh. is expected. Apart from supplying the requirements of the railways, power will be used in the exploitation of local raw materials and to facilitate the development of the following industries:

Wood pulp.
Artificial silk.
Electro-chemistry.
Electro-metallurgy.

Work on the Bicaz dam is to begin in the near future. The first sections of railway track to be electrified are:—

Bucarest-Ploești (59 km.—37 miles).

Ploești-Brașov (111 km.—69 miles, of which Ploești-Brașov is double-track).

Brașov-Sighișoara (129 km.—80 miles).

Up till the beginning of 1943, however, none of these projects appeared to have been begun.

The Rumanian Government is also reconsidering the much-discussed plan for the exploitation of the Danube Rapids at the Iron Gates, where the river enters Rumanian territory. If the work is carried out it will be supervised by a Rumanian-Bulgarian-German concern. The eventual output from this site should reach 3,000 million kWh. per annum, requiring an installed capacity of about 6-700,000 kW. (The largest station yet built in Europe is that on the Dnieper, having an installed capacity of 560,000 kW.) The output from the proposed station will supply the needs of South Rumania (including the railways), North Bulgaria and perhaps also East Serbia.

The important oil-field station of Grozăvesti in Bucarest has been adapted to use natural gas, and is believed to have been extended.

[19c]